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13049 U.S. PTO



121803

PROVISIONAL APPLICATION COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION under 37 CFR 1.53 (b)(2)

Docket Number	81,642	Type a plus sign (+) inside this box →	+
INVENTOR(s)/APPLICANT(s)			
LAST NAME	FIRST NAME	MIDDLE INITIAL	RESIDENCE (CITY AND EITHER STATE OR FOREIGN COUNTRY)
Stern	Alan	J.	2007 Vivian Drive, Round Rock, TX 78681
TITLE OF THE INVENTION (280 characters max)			
SURFACTANT ENHANCED QUICK RELEASE PESTICIDE GRANULES			
CORRESPONDENCE ADDRESS			
Legal Department Huntsman LLC P.O. Box 15730			
STATE	Austin, Texas	ZIP CODE	78761 COUNTRY USA
ENCLOSED APPLICATION PARTS (check all that apply)			
<input checked="" type="checkbox"/> Specification		Number of Pages <u>11</u>	
<input type="checkbox"/> Drawing(s)		Number of Sheets <u> </u>	
<input type="checkbox"/> Small Entity Statement		<input checked="" type="checkbox"/> Other (specify) <u>Postcard</u>	
METHOD OF PAYMENT (check one)			
<input type="checkbox"/> A check or money order is enclosed to cover the Provisional filing fees		PROVISIONAL FILING FEE AMOUNT	\$ 160.00
<input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge the filing fee to Deposit Account Number: <u>08-3442</u>			

2154 U.S. PTO
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121803

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.
☐ Yes, the name of the U.S. Government agency and the Government contract number are:

Respectfully submitted,

SIGNATURE

Date

12/18/03

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37,469

☐

Additional inventors are being named on separately numbered sheets attached hereto.

Certificate of Mailing
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I hereby certify that this correspondence is being deposited with the U.S. Postal Service Express Mail Service No. EV165093698US addressed to Commissioner for Patents, Alexandria, VA 22313 on December 18, 2003.

Martha Victory

PROVISIONAL APPLICATION FILING ONLY

Surfactant Enhanced Quick Release Pesticide Granules

Field of the Invention

The invention relates generally to insecticide compositions, and more particularly to pesticides which are bound to a solid inert carrier, wherein the carrier containing the pesticide is applied to an area to be treated.

Description of the Related Art

It is known that compositions containing pyrethroid insecticides, such as bifenthrin, disposed on an inert carrier often do not possess acceptable efficacy when they are formulated as broadcast granules on BIODAC® (available from GranTek Inc., Granger, Indiana 46530) as a carrier as compared with cases where other granular carriers such as peanut hulls, ground corn cobs and other inerts are used. It seems from what I have observed that the pyrethroids as a class bind tightly to the BIODAC® inorganic/organic matrix, and upon application to soil, the pyrethrins are only released slowly and/or incompletely, thus providing a lower than desired level of active chemical per area, and hence lower effectiveness. However, because BIODAC® has certain advantages over other inert carriers, it would be advantageous to overcome its limitations associated with poor release characteristics relative to insecticide binding.

I have found that the presence of a surfactant (at a level of surfactant of between about 6 to about 12% by weight based on the total weight of the final supported product) on BIODAC® granules along with bifenthrin greatly enhances its insecticidal activity compared to the same material on BIODAC® granules.

The agricultural sprayable formulations which contain surfactants is well known. In such formulations, surfactants wet and disperse particles of active ingredient(s) in the concentrate or upon dilution prior to spraying, and wet the target surface with the pesticide spray to achieve more effective coverage of the target. The prior art contains some instances where a surfactant is included in a granular composition that is intended to be applied in its dry, granular state. For example, US Patent 5,750,130 which discloses how to make an abrasion resistant granule through the use of a molten coating material such as a wax. It also discusses the use of "wax soluble surfactants" to control the release rate of a pesticide from a matrix of wax, pesticide, inert carrier. US Patent 6,004,904 a method for the selective control of an unwanted turfgrass or weed species in the presence of a desired turfgrass species at a turfgrass locus, said method comprising applying to said turfgrass locus a herbicidally effective amount of an isoxazole compound.

The presence of surfactant(s) causes the efficacy of granular pesticides comprising bifenthrin disposed on BIODAC® granules to be improved due to accelerated release of the active pesticide to the surrounding environment. Once released from its inert granular carrier, the insecticide is available to exert its desired effect, such as the killing of insects. Thus, granules according to one preferred form of the present invention contain an insecticide, a cellulose based carrier, and a surfactant.

Brief Summary of the Invention

One object of the present invention is to provide an acceptably efficacious supported bifenthrin formulation designed to be used as a "broadcast granule". Previously, bifenthrin, when formulated on BIODAC® granules was not nearly as effective at killing undesirable insects as bifenthrin in other formulations, and it is believed that bifenthrin has an unusual affinity for the BIODAC® granule matrix. Because it is tightly bound within the granule matrix, it does not want to leave the granule and enter the environment where it must be to be effective.

It has been found that certain surfactants will overcome the affinity/binding of bifenthrin to the inert carrier BIODAC®. Thus, incorporating an effective bifenthrin-freeing amount of surfactant to the granular formulation enhances the activity to acceptable levels.

I have found that by adding about 5-15% surfactant to the granules along with the bifenthrin (0.1% by wt.) the activity of the bifenthrin is restored to acceptable levels. I have also found the strange fact that if an equivalent amount (on a molar basis) of an organic solvent is substituted for the surfactant, the insecticidal activity of the formulation is reduced. The range of surfactants I have identified as being useful in combination with bifenthrin on a BIODAC® granule to yield an acceptably-efficacious bifenthrin on BIODAC® granule include: non-ionic alcohol ethoxylates, fatty amine ethoxylates, and alkylphenol ethoxylates, including nonylphenol ethoxylates.

Detailed Description of the Invention

The invention is best carried out by dissolving bifenthrin (or a bifenthrin MUP) in a suitable surfactant falling within one of the aforesaid classes, or any other surfactant. Surfactants that are liquid at ambient temperature are preferred because of the ease of handling. The range of surfactants that should work well are: all water-soluble or dispersible surfactants. Minor amounts of organic solvents may be used to increase the fluidity of the surfactant/bifenthrin solution to ease the process of making the granules. After preparing the solution of bifenthrin/surfactant, it is added to the blank BIODAC® granules while tumbling the granules in a mixer. It is important to evenly distribute the solution during this process so that each granule absorbs as close to about the same amount of surfactant/bifenthrin solution as all of the other granules. Mixing is continued until all the liquid has been absorbed by the granules. Preferably, the final composition contains less than 15% liquid, but at least 5% surfactant. These percentages are by weight based upon the total weight of the finished granules. The relative amounts of bifenthrin, surfactant, and solvent (if any) may be adjusted to achieve the desired level of active ingredient and ease of processing.

Compositions and test results

16 granular formulations were prepared that contained 0.1% bifenthrin (0.77% of a MUP containing 13% bifenthrin) and various combinations of surfactant and/or inert organic diluent. Each granule formulation contained 88% BIODAC® 12/20 granules, 0.77% bifenthrin MUP, and 11.23% surfactants/solvents. Testing of the formulations showed that the greatest insect

control was provided by the granule formulations containing 6% or more surfactant. Several of the formulations performed very well in lab and field tests.

Example 1	
Talstar SFR MUP (13% bifenthrin)	0.77
BIODAC® 12/20 granules	88
CARSPRAY® 300 dialkyldimethyl quat	2.66
Tall Oil Fatty Acid	8.57

Example 2	
Talstar SFR MUP (13% bifenthrin)	.77
BIODAC® 12/20 granules	88
CARSPRAY® 300 dialkyldimethyl quat	2.66
Propylene glycol	8.57

Example 3	
Talstar SFR MUP (13% bifenthrin)	0.77
BIODAC® 12/20 granules	88
CARSPRAY® 300 dialkyldimethyl quat	2.66
SURFONIC® L24-4	8.57

<hr/> Example 4	
Talstar SFR MUP (13% bifenthrin)	0.77
BIODAC® 12/20 granules	88
CARSPRAY® 300 dialkyldimethyl quat	2.66
EXXSOL® D-110	8.57

<hr/> Example 5	
Talstar SFR MUP (13% bifenthrin)	0.77
BIODAC® 12/20 granules	88
CARSPRAY® 300 dialkyldimethyl quat	2.66
Propylene Carbonate	8.57

<hr/> Example 6	
Talstar SFR MUP (13% bifenthrin)	0.77
BIODAC® 12/20 granules	88
CARSPRAY® 300 dialkyldimethyl quat	2.66
SURFONIC® N-40 surfactant	8.57

<hr/> Example 7	
Talstar SFR MUP (13% bifenthrin)	0.77
BIODAC® 12/20 granules	88
CARSPRAY® 300 dialkyldimethyl quat	2.66
SURFONIC® T-6 surfactant	8.57

Bioassay Result: Very good insect control

Example 8	
Talstar SFR MUP (13% bifenthrin)	0.77
BIODAC® 12/20 granules	88
CARSPRAY® 300 dialkyldimethyl quat	2.66
Aromatic 200 solvent	2.5
SURFONIC® N-120 surfactant	6.07

Bioassay Result: Very good insect control

Example 9	
Talstar SFR MUP (13% bifenthrin)	0.77
BIODAC® 12/20 granules	88
VAROSOFT® 222 surfactant	2.66
EXXSOL® D-110 solvent	8.57

Example 10	
Talstar SFR MUP (13% bifenthrin)	0.77
BIODAC® 12/20 granules	88
SURFONIC® T-6 surfactant	2.66
EXXSOL® D-110	8.57

Example 11	
Talstar SFR MUP (13% bifenthrin)	0.77
BIODAC® 12/20 granules	88
ADOGEN® 442	2.66
EXXSOL D-110	8.57

Example 12		
Talstar SFR MUP (13% bifenthrin)		0.77
BIODAC® 12/20 granules pretreated with Varisoft 222	88	
EXXSOL® D-110		11.23

Example 13		
Talstar SFR MUP (13% bifenthrin)	0.77	
BIODAC® 12/20 granules	88	
SURFONIC® L24-4~ surfactant	11.23	

Bioassay Result: Very good insect control

Example 14		
Talstar SFR MUP (13% bifenthrin)	0.77	
BIODAC® 12/20 granules	88	
SURFONIC® N-40 surfactant	11.23	

Bioassay Result: Very good insect control

Example 15		
Talstar SFR MUP (13% bifenthrin)	0.77	
BIODAC® 12/20 granules	88	
SURFONIC® T-6 surfactant	11.23	

Bioassay Result: Very good insect control

<u>Example 16</u>	
Talstar SFR MUP (13% bifenthrin)	0.77
BIODAC® 12/20 granules	88
HARTOSOFT® 5080M	2.66
EXXSOL® D-110	8.57
<u>Bioassay Result: Poor insect control</u>	

What is claimed is:

1) A granular composition comprising:

- a) 85-95 % by weight of an absorptive inert cellulosic granular carrier;
- b) 0.01-10 % by weight of at least one pesticidal active ingredients;
- c) 5-15 % by weight of one or more surfactants,

wherein all weights percents are expressed as percentages based on the total weight of the final granular composition.

A granular composition according to claim 1, where the pesticide is an insecticide.

A granular composition according to claim 1, where the pesticide is a pyrethroid.

A granular composition according to claim 1, where the pesticide is bifenthrin.

A granular composition according to claim 1, where the surfactant is a nonionic surfactant with a solidification temperature below 50° C.

A granular composition according to claim 1, where the surfactant (or surfactants) is a nonionic surfactant(s) selected from nonylphenol ethoxylates, fatty alcohol ethoxylates, or fatty amine ethoxylates.

A method for preparing the composition of claim 1 in which the pesticide and surfactant(s) are applied to the absorptive granules in a

A method for controlling pests by applying the composition of claim 1 to the locus of the pest to be controlled.

A method for controlling pests by applying the composition of claim 1 to the locus of the pest, where the pesticide is a pyrethroid, and the pest is an insect.